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SELF-REINFORCEMENT EFFECTS: AN ARTIFACT OF SOCIAL STANDARD SETTING?

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Two studies were conducted to identify mechanisms responsible for observed "self-reinforcement" effects. In Experiment 1, using a studying task, self-reinforcement procedures did not work when they were private (i.e., when others are not aware of the goals or contingencies), but did work when they were public. Self-delivery of consequences added nothing to the effectiveness of the procedure. The data suggested that public goal setting was the critical element in the procedure's effectiveness. In Experiment 2, an applied extension, goal setting alone was effective in modifying over a long time period studying behaviors of people with significant studying difficulties, but only when the goals were known to others. Overall, the two experiments make more plausible the view that self-reinforcement procedures work by setting a socially available standard against which performance can be evaluated. The procedure itself functions as a discriminative stimulus for stringent or lenient social contingencies. The application of this mechanism to other problems of applied significance is briefly discussed.

DESCRIPTORS: self-control, self-reinforcement, goal setting, social standard setting, public knowledge of treatment

Self-reinforcement occupies a pivotal place in social learning theory accounts of behavior change (Bandura, 1978). Given a particular history, humans are said to learn to set performance standards, self-observe, self-evaluate, and self-reinforce their behavior (Kanfer, 1970, 1977). The concept of self-reinforcement has come under heated attacks by radical behaviorists, who wish to avoid putting the ultimate causes of behavior in more behavior of the same organism (e.g., Catania, 1975, 1976; Goldiamond, 1976a, 1976b; Rachlin, 1974). This, in turn, has sparked rebuttals from social learning theorists (Bandura, 1976, 1981; Mahoney, 1976; Thoresen & Wilbur, 1976) who argue that individuals can, in fact, control themselves by reinforcing their own behavior.

There have been three distinguishable lines of theoretically driven research on self-reinforcement procedures. One approach has been to see if self-reinforcement procedures are as effective as external reinforcement procedures (Martin, 1979, 1980; Sohn & Lamal, 1982). Unfortunately, the self-reinforcement procedures used in these studies have been contaminated by external sources of influence, such as demand characteristics, experimenter-set goals or contingencies, feedback, monitoring, and limitations on the subjects' control of all relevant aspects of the procedures (Gross & Wojnilower, 1984; Jones, Nelson, & Kazdin, 1977; Martin, 1979, 1980; Morgan & Bass, 1973; Munt, 1979; Sohn & Lamal, 1982). It has not yet been shown that a self-reinforcement procedure that is relatively devoid of external variables will work as well as external reinforcement, or indeed, will work at all.

A second line of research has compared complete self-reinforcement packages to elements in a self-control chain said to be present by social learning theorists: setting goals, monitoring behavior, and evaluating performance. Results of these component analysis studies are inconsistent. Self-reinforcement packages have been shown to be superior to self-monitoring alone in some studies (e.g., Bellack, 1976; Mahoney, Moura, & Wade, 1973; Wall, 1982), but have failed to differ in other

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studies (e.g., Castro & Rachlin, 1980; Chapman & Jeffrey, 1978; Rehm et al., 1981). Self-consequation has generally added little to goal setting (e.g., Hayes et al., 1984; Kirsch, 1978; Spates & Kanfer, 1977). Social learning theorists, however, can (and have) claimed that self-monitoring and goal setting automatically engage self-evaluation and self-consequation mechanisms (e.g., Bandura, 1981). Thus, such research does not necessarily help us distinguish between various theoretical views of self-reinforcement procedures, until it can be shown how self-monitoring or goal setting work.

A final line of research has examined effects for self-reinforcement and similar procedures when major parameters of external reinforcement are violated. For example, certain types of "self-punishment" procedures can be as effective as or more effective than self-reinforcement procedures even when the effects should be in the opposite direction (Castro, Perez, Albanchez, & Ponce de Leon, 1983; Castro & Rachlin, 1980), that delivering a "consequence" in these procedures before the behavior is more effective than delivering one after it (Nelson, Hayes, Spong, Jarrett, & McKnight, 1983), or that deprivation of the supposed reinforcer has no effect on the procedure (Nelson et al., 1983). This type of research has greatly limited the useful scope of the concept of self-reinforcement in a theoretical sense, but with the exception of Rachlin's model (to be discussed later) has not suggested an alternative model. The studies reported here were designed to offer and test one alternative formulation.

In a previous study (Hayes et al., in press), it was demonstrated that self-reinforcement procedures improved performance on a studying task when combined with feedback on the correctness of performance, but not in the absence of feedback. Feedback alone had no effect. This self-reinforcement effect, however, was equally great in two different self-reinforcement groups. One was instructed in self-reinforcement and given the option to use the entire procedure but was required only to set a goal. The second group received the same training but was required to set a goal and contingency and to monitor and self-consequate behavior. A check on the use of the procedure found that the second group used the full self-reinforcement procedure significantly more, but showed the same outcome as the group where use of the procedure was optional. Because only goal setting was the same in both groups, it may be the critical element in self-reinforcement procedures and may interact with feedback.

Several articles have shown an interaction between goal setting and feedback (see Fellner & Sulzer-Azaroff, 1984, and Rapp, Carstensen, & Prue, 1983, for a recent review and annotated bibliography, respectively). A social learning account would explain this by suggesting that goal setting establishes a self-standard for performance. Once established, performance will be self-evaluated and positively self-consequated only if the criterion is reached. Feedback allows subjects to know whether the criterion was reached (Bandura & Cervone, 1983; Locke, 1980).

Another possibility is that goal setting works not because it sets a *self*-standard, but because it sets a *social* standard. Subjects undoubtedly have a long history of differential social consequences for doing what they say they will do. In most experiments on self-reinforcement subjects know that the experimenter will ultimately know their goal. Thus, when subjects set a goal, they could have established a socially available standard against which their performance could be evaluated. This alters possible social contingencies and thus, behavior. Such a mechanism could also explain any effects due to self-consequation, in that the public knowledge of a set contingency might alter social contingencies surrounding performance. Thus, both goal setting and self-consequation might operate through social standard setting as a mechanism.

Recent research in our laboratory has enhanced the plausibility of such an account by showing that several popular behavior therapies work only when publicly known. Coping self-statements, for example, apparently work when they are publicly known, but have no effects at all when the subjects are deceived into thinking that no one (not even the experimenter) can know what statement was given to them. This has also been shown with speech anxiety (Zettle & Hayes, 1983) and pain tolerance (Hayes & Wolf, 1984). Perhaps most

surprisingly, even disinhibitory modeling apparently has no effect when private but does when public. This was shown clearly in a study of children who were afraid of the dark (Rosenfarb & Hayes, 1984). Thus, many popular therapies may be based on the establishment of social standards.

The purpose of the first study was to examine social standard setting engaged by public goal setting as a mechanism accounting for the effectiveness of self-reinforcement procedures. In public situations, it is impossible to distinguish effects due to self-standards and social standards. Effects can be distinguished, however, by arranging for persons to engage in aspects of a procedure privately, that is, convincing them that no one can ever know what they did. If the procedure still works in such a condition, it could not work through social standard setting.

EXPERIMENT 1

The Basic Analysis

The first experiment compared private and public goal setting, with and without self-delivery of external consequences in a group of people seeking help in studying for the Graduate Record Examination (Rosenfarb, 1981).

METHOD

Students and Setting

Fifty volunteers were solicited through newspaper ads, radio and television announcements, fliers, and in-class announcements which called for people who wanted help preparing for the Graduate Record Examination. To ensure a more clinically relevant sample, students scoring above 3.00 correct answers per passage were eliminated. A total of 26 students (20 females, 6 males), ranging in age from 20 to 60 (average age = 28.2 years) participated in the study. Most were college students, and no student received extra credit for participation.

Materials and Apparatus

Students were run individually in a small room with a study carrel. The reading materials were nine passages with questions taken from the reading comprehension sections of the book, *How to Pass High on the GRE* (Turner, 1980). The materials to be read were mounted in a modified teaching machine (cf. Mahoney, Moore, Wade, & Moura, 1973). After reading a passage, the students chose one of five possible answers to each of six questions, recorded their answers on the reading material sheets and then advanced the machine to find the correct answer. Feedback was used because earlier research (Hayes et al., in press) had shown that feedback was essential to the effectiveness of self-reinforcement procedures. The machine would not reverse, so answers could not be changed following feedback.

Experimental Design

The experiment was a 2 (public vs. private) by 2 (goal setting with or without self-delivery of external consequences) by 2 (baseline vs. experimental phase) factorial design with repeated measures on the final factor. A feedback-only control group was also run.

Procedure

Baseline. All students were given their choice of a bag of M & Ms, raisins, or peanuts. They were told that the edible was theirs to keep. Baseline lasted for three trials. A trial was defined as reading and answering questions to one passage. The same sequence of reading passages was used with all students throughout the experiment. Following the passage, the students answered six multiple-choice questions. During baseline, the students were told to eat the edibles whenever they wished. Students who averaged over three correct answers per passage were eliminated to avoid ceiling effects and to produce a population more similar to those who would wish help with study skills.

Experimental phase. The experimental phase consisted of six trials. Students were randomly assigned to one of five groups. The conditions for each group were as follows:

1. Control group (n = 6): The control group was told to continue reading passages and answering questions as they did during the first three trials. They were told to eat the edibles whenever they liked.

2. Private goal setting with no self-consequation group (n = 4): These students were told that during this phase they would set a goal for the number of correct answers to each passage. These students were led to believe that no one could know their goal. They were told to write down a goal (one to six correct answers for each passage) and put it in a box which contained other students' goals. They were told not to tell the experimenter their goal in order to make the procedure as similar as possible to what they would do when studying for the GRE at home. They were told that others in "a yoked control group" would then choose their goal from among those in the box, but that these other students would not know whose goal they were choosing. In actuality, the other sheets in the box were blank, and the students' goals could therefore be determined. Students were told to eat the edible whenever they liked.

3. Public goal setting with no self-consequation group (n = 6): These students were given the same instructions as the private goal setting with no self-consequation group. When they had written down their goal, however, the experimenter took the piece of paper from the students and said, "So your goal for the number of correct answers on each passage is ____?" If the student agreed, the experimenter put the piece of paper into the box.

4. Public goal setting with self-consequation group (n = 6): This group set their goals exactly as the previous group. In addition, the experimenter described the rationale behind self-reinforcement, and how to set and follow a self-imposed contingency. Students were told to use the edibles as a convenient consequence. They were provided materials before each passage for setting a goal, setting a contingency using the edibles, and self-evaluating performance. They were told that they were expected to use the procedure by eating a predetermined amount of their edible only if they met their goal. In order to ensure privacy of self-consequation per se students did not tell the experimenter how much of the edible they chose to eat when their goal was met.

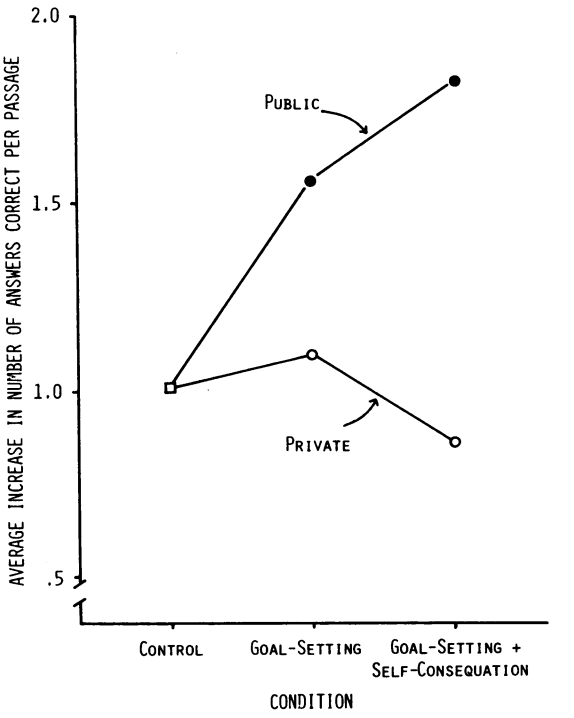

Figure 1. Effect of public and private goal setting and goal setting plus self-reinforcement on the difference in average number of answers correct per passage from baseline to treatment phases.

5. Private goal setting with self-consequation group (n = 5): Students in this group set their goal exactly as in the other private group, and they were given the same self-reinforcement instructions as the previous self-consequation group.

Following the experimental phase, students were given a variety of attitudinal measures and a thorough explanation of the need for deception. Students were given the option to withdraw their data if they so chose (none did).

Results and Discussion

Baseline Scores

A one-way analysis of variance revealed no statistically significant differences among the five groups in the average number of answers correct during baseline. A two-way analysis of variance, excluding the control group, also revealed no significant differences among the groups.

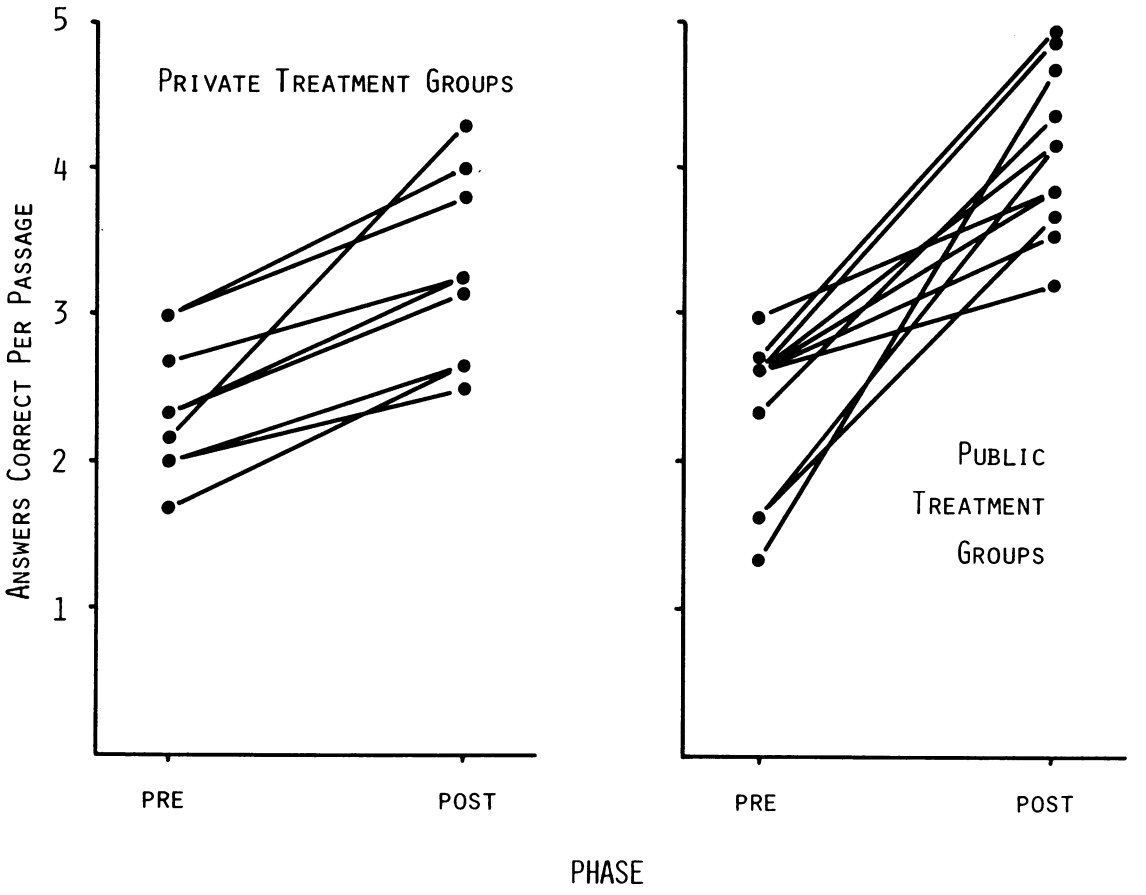

Figure 2. Pretest and posttest performance of each student in the public and private conditions (collapsed across goal setting and goal setting plus self-delivery of consequences).

Outcome Measure: Difference Scores

Because of the lack of significant differences among the groups in baseline performances, a difference score looking at the average number of answers correct per passage during the experimental phase minus the average number of answers correct in the baseline phase was used as the main dependent measure. First, a two-way ANOVA, excluding the control group, was calculated. The main effect for the public versus private comparison was statistically significant, $F(1, 16) = 4.99$, $p < .05$), whereas the main effect for self-consequation, $F(1, 16) = 0.00$, NS, and the interaction of self-reinforcement and the public versus private manipulation, $F(1, 16) = 0.77$, NS, were not significant. These groups were then compared to the control group. The combined private group did not differ significantly from the control group, $t(13) = 0.21$, NS, but the combined public group did, $t(15) = 2.09$, $p < .05$, one-tailed t. The nature of these results can be seen in Figure 1.

These results were consistent across students in the five groups. Of the public students, 64% (7/11) improved at least 1.5 answers correct per passage from pre- to posttest, whereas only 20% (3/15) of the private or control students did so. Using a more stringent criterion of +2 answers correct per passage it was found that 45% (5/11) of the public students reached this level, compared to

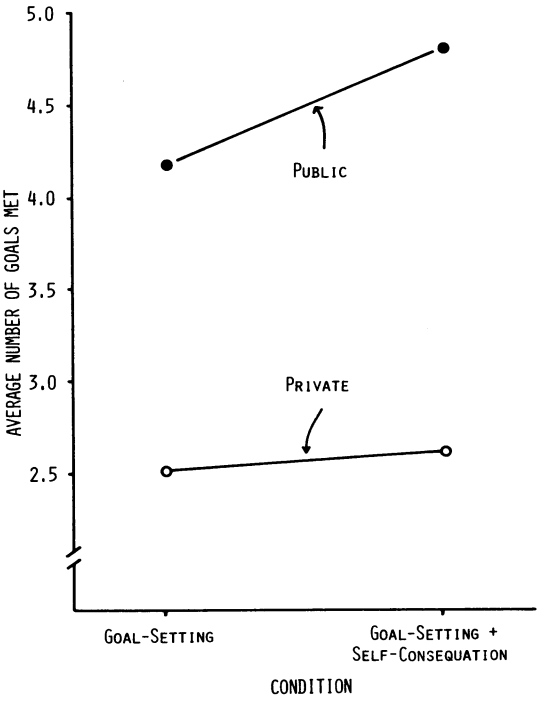

Figure 3. Effect of public and private goal setting and goal setting plus self-reinforcement on the average number of goals met.

only 7% (1/15) of the private or control students. The data for individual students in the treatment groups are shown in Figure 2.

Goal setting scores. Using a two-way analysis of variance, no significant differences were found between groups for the number of correct answers set as a goal. A trend toward significance, however, was found for the public-private comparison on the number of goals met, $F(1, 16) = 4.19$, $p < .06$. The number of goals met measures the number of trials on which each student met or surpassed his or her goal. As shown in Figure 3, students in the public goal setting and public goal setting plus self-reinforcement groups met their goal more times than did students in the private goal setting and private goal setting plus self-reinforcement groups. No significant main effects were found for self-reinforcement or for the interaction of self-reinforcement and the public-private comparison for the number of goals met.

This effect was also consistent across students. In the public groups, 73% (8/11) of the students met either five or six of their set goals during the six experimental trials. Only 11% (1/9) of the private students did this well.

Experiment 1 indicates that self-reinforcement procedures may work through social standard setting. All the previous self-reinforcement studies used procedures that confound the specific technique with effects due to the public availability of components of the technique, especially goal setting.

In addition, the results suggest that self-consequation procedures did not add to the effectiveness of public goal setting alone. This is in general accord with the preponderance of the literature (Sohn & Lamal, 1982). Bandura (1981) has suggested that these kinds of consequences could not possibly function as reinforcers for students. To test this, 20 college students were divided into two groups and exposed to the same type of study materials and consequences as in Experiment 1. After a baseline phase, one-half received the edibles contingent on correct answers, and the other half received them noncontingently in a manner yoked to the contingent group. The groups did not differ significantly at baseline, but the contingent group improved significantly more (one answer correct/passage) in the experimental phase than the control group, $t(18) = 2.58$, $p < .02$). Thus, when students selected among these three edibles, their contingent delivery functioned as a reinforcer for studying behavior.

Experiment 1 was designed to make a conceptual point. No emphasis was placed on the long-term beneficial impact of these treatments, because numerous studies have documented clinically beneficial effects due to similar self-control procedures. Nevertheless, it seemed worthwhile to show that the crucial variable identified in Experiment 1, public goal setting, can be a powerful intervention.

It has long been known that private commitment has little effect on behavior (Kretch, Crutchfield, & Ballachey, 1962). Unfortunately, previous work on private commitment may not apply to

self-control problems. Social psychologists (e.g., Kiesler, 1971) have primarily been interested in commitment as a variable that influences attitudes, opinions, and judgments (Deutsch & Gerard, 1955; Gerard, 1964; Hovland, Campbell, & Brock, 1957; Hoyt & Centers, 1972; Kiesler, Pallak, & Kanouse, 1968; Pallak, Mueller, Dollar, & Pallak, 1972). Very few studies have attempted to apply these findings to actual behavior change of some social significance (e.g., Pallak & Cummings, 1976). Apparently, no studies have been reported on the long-term effect of public versus private goal setting in the area of self-control.

EXPERIMENT 2

An Applied Extension

The purpose of this experiment was to examine the effect of public and private goal setting on the self-control shown by students who believe they have significant problems with their study skills. If goal setting works by engaging self-standards, goal setting should increase performance in both the public and private groups. If goal setting works because socially available goals are discriminative stimuli in the presence of which differential social consequences for goal meeting are possible (i.e., if they set social standards), only the public group should improve. Conversely, goal setting may not influence performance over a long period of time with students who complain of self-control difficulties.

Method

Students

Twenty-one college undergraduates were recruited through newspaper advertisements, radio announcements, posters, fliers, and in-class solicitations calling for students interested in improving their study skills. They received no credit for participating and were required to make a $10 attendance deposit, which was refunded if they attended the assessment and treatment sessions. They were randomly assigned to one of three groups of seven each.

Procedure

Pretest. Immediately preceding the first treatment session, each student completed a test consisting of 40 true-false and multiple-choice questions that assessed vocabulary and knowledge of proper study skills. The percentage of correct answers on this test was the main dependent variable in the study.

Treatment sessions. All students received the identical attention-placebo treatment, which was administered to make the goal setting manipulation (described later) less obviously a focus of the experiment, to increase the credibility of the intervention, and to provide a strong floor of social influence in the control group against which to evaluate the added effects of public and private goal setting. Each goal setting group was run separately as a group immediately after pretesting, and again 2 weeks later.

The first placebo (plus goal setting) session lasted 3 hr, with a 10-min break after the first 90 min. The session consisted of a description of the study modules (described later), a discussion of students' goals in studying and of the value of a college education, a description of problems (e.g., fear of failure, fear of success) that might interfere with reaching eductional goals, a general orientation to a behavioral view of the development of good study habits, and the goal setting manipulation (Wulfert, 1983). Based on the findings of our previous research (Hayes et al., in press) all students received confidential written feedback during the break on their vocabulary and study skills pretest scores. This also enabled students in the goal setting conditions to set more knowledgeable goals concerning their posttest performance.

Immediately following the first session, students were asked to complete a preexperimental questionnaire that was designed to assess the degree of importance students attributed to good study skills, how motivating they perceived the introductory treatment session to be, and how much they believed this session would influence their study behavior during the self-directed phase of this experiment. Furthermore, students in the public and

private commitment groups were asked how sure they were that they would meet the goals they had set for themselves; and those in the no-commitment condition were asked how sure they were that they would improve from pre- to posttest.

The second session, designed to strengthen further the placebo value of the treatment, occurred 2 weeks later and approximately in the middle of the self-directed portion of the program (described later). The session consisted of a 90-min discussion of any problems students had encountered in the first part of the self-directed study phase, and a recounting of the ideas presented in the first treatment session. All groups were run by randomly assigned graduate students in clinical psychology who followed a detailed manual.

Self-directed study phase. At the end of the first treatment session, each subject received a time schedule showing when a set of self-study modules would be available. These 12 modules contained written information on how to improve study habits and vocabulary. The modules were based on the literature on study skills (Devine, 1981; Ehrlich, 1961; Locke, 1975; Pauk, 1974; Strang, McCullough, & Traxler, 1961; Voeks, 1970) and on vocabulary building (Brown, 1971; Lewis, 1963). To gain access to a module, students had to request the material from a reserve-desk librarian. This automatically produced an unobtrusive written record of each student's use of the material. Each module was available only for 3 successive days and was then removed and replaced by the next one. The material was designed so that an average reader could study it in 1 hr. The contents of the pre- and posttests described earlier were drawn from the modules so that students who studied a larger number of them had a greater chance to improve their scores at posttest.

Goal setting manipulation. All goal setting manipulations were conducted at the end of the first treatment session. There were three conditions: public goal setting, private goal setting, and a control group.

Public goal setting group. These students were asked to set a goal for the number of modules they would study (from 0 to 12) and the score they would receive on the posttests (from 0% to 100%). They wrote down their goals on a sheet provided by the group leader for that purpose, and signed their names. They were then told to announce their goals to the other members of their treatment group.

Private goal setting group. These students set goals in the same manner as those in the public goal setting group. However, they neither signed their names nor read their goals to the other group members, but were requested to deposit their statements in a sealed box. All were collected at the same time, in an apparently random fashion (i.e., sheets were not deposited in a particular sequence). They were asked not to discuss their goals with anyone, and it was emphasized that their statements would remain completely anonymous. To increase the credibility of this manipulation, students were told that their goals would later be used in a "yoked-control" condition, in which other students would randomly draw their goals from among those in the box. In fact, each sheet had been surreptitiously marked before the session (with a dot in one of the "e"s) and a record was privately kept of who received which sheet. Thus, each student's goal was known to the experimenter.

Control group. These students were not asked to set any goals. They met as long as the other two groups, however, by extending their discussion in the first session.

Posttest. After the last study module was removed (after 36 days), all students attended a posttest session, similar to the pretest. An alternative form of the vocabulary and study skills test was administered (the order was counterbalanced across students), along with a variety of attitudinal measures. Students were thoroughly debriefed on the need for deception in the experiment and were given the option to withdraw their data if they so chose (none did).

Results and Discussion

The primary dependent measure was the percentage of correct answers on the vocabulary and study skills test, which assessed the amount learned from the study modules. A one-way ANOVA

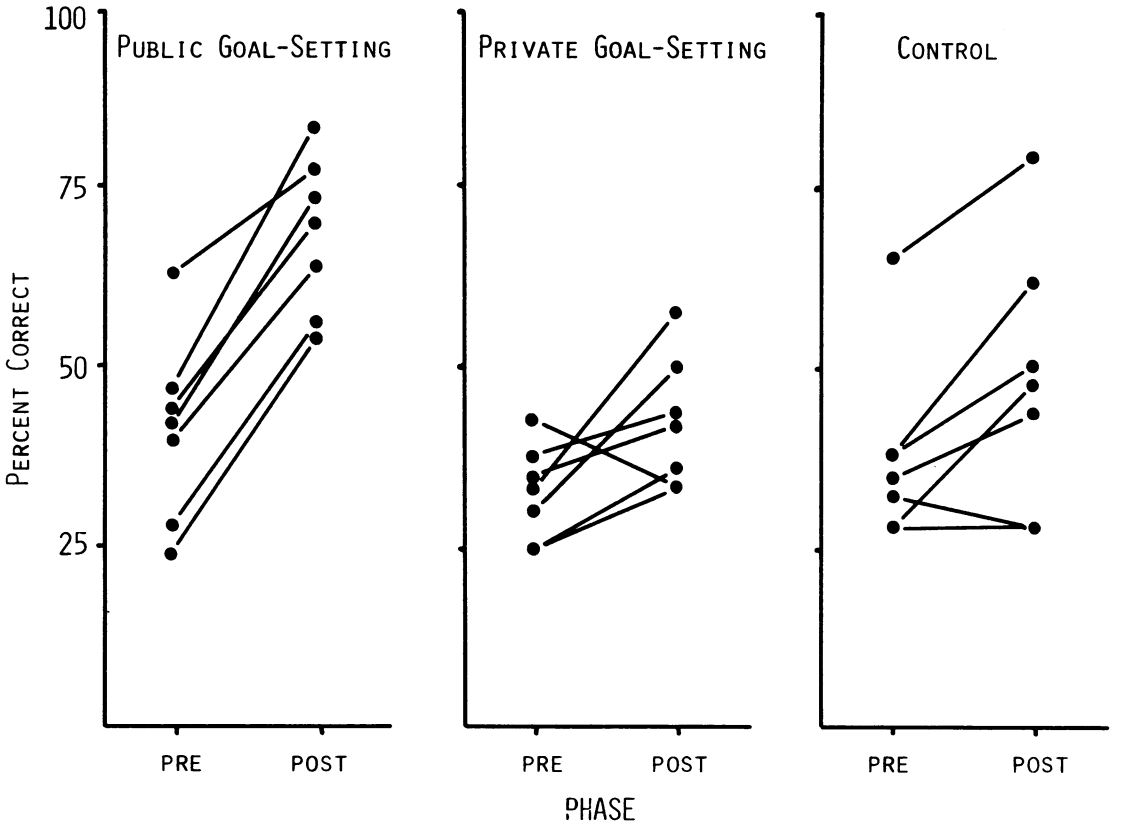

Figure 4. Individual pretest and posttest scores for all students in Experiment 2.

showed that the groups did not differ at pretest (the means for all measures are shown in Table 1). Difference scores were then calculated by subtracting pretest scores from posttest scores. A one-way ANOVA of the difference scores did show a statistically significant difference, $F(2, 18) = 7.14$, $p < .01$. The public goal setting group improved an average of 26.9 percentage points in their scores, whereas the private goal setting and control groups improved an average of 9.9 and 10.7 percentage points, respectively. Post hoc comparisons using Tukey's test showed that the public group differed ($p < .05$) from the private and control groups, which did not differ significantly from each other. The same effects were shown when the results were calculated separately for the vocabulary and the study skills items on the test. Thus, public goal setting led to a significant improvement in study skills, and one that was over 2½ times that of the other two groups. Private goal setting had no apparent impact beyond the practice and placebo effects seen in the control group.

These effects were highly consistent across individuals. The individual pre- and posttest scores for vocabulary and study skills are shown in Figure 4. In the public goal setting group, 86% (6/7) of the students improved more than 20 grade points. In both the private goal setting and control groups, only 14% (1/7) of the students improved that much.

The groups did not differ in the number of modules they committed themselves to study ($p > .10$) or in the level of posttest performance they committed themselves to reach ($p > .10$). Thus, their commitments were similar, although their performance differed (see Table 1).

Surprisingly, the groups did not differ in the actual number of modules read ($p > .10$, see

Table 1
Mean Values for each Main Measure for each Group in Experiment 2

	Grade pretest	Grade posttest	Modules read	Modules read minus goal	Grade minus goal	Felt pressure
Control group	37.9%	48.6%	7.0	—	—	41.3
Private goal setting	32.7%	42.6%	4.3	−5.0	−36.4	49.7
Public goal setting	41.7%	68.6%	8.0	−2.0	−15.0	69.4
	ns	$p < .01$	ns	$p < .05$	$p < .15$ (ns)	$p < .20$ (ns)

Table 1), although the average number of modules read by the control group (7 of 12) created a fairly high floor against which effects could be seen. Apparently, the public goal setting students studied more effectively but not necessarily more often than the other groups. This may have been a result of their publicly setting goals for the grade they would receive on the posttest.

The public group also came closer to meeting its goals. For each student in the two goal setting groups, the number of modules read was subtracted from the goal set. A t test on these scores showed that the public goal setting group was significantly closer to its goals than was the private goal setting group, $t(12) = 1.97$, $p < .05$ (see Table 1). A similar analysis on the difference between the posttest grade goal and actual performance was not significant, $t(12) = 1.31$, $p < .15$ (see Table 1).

A number of self-report measures were collected in the pre- and postexperiment questionnaires. Using 7-point Likert-type scales, these assessed the degree of importance attributed to study skills and to vocabulary, how motivating students felt the treatment session to be, how certain they were to improve their grades in the posttest, how useful they felt the modules were, and how pressured they felt to improve their grades on the skills and knowledge test. ANOVAs on these measures failed to find any statistically significant differences between the groups.

Overall, the effects of public goal setting were relatively strong, long lasting, and highly consistent across students. Importantly, these effects were shown in a population that was seeking help for a self-control problem. Further, the effects were measured in a posttest that occurred 5 weeks after the students had set goals and showed that the public group improved over twice as much as did the other groups. Thus, public goal setting alone seems capable of clinically significant effects on self-control problems, in marked contrast to private goal setting, which showed no trend toward an effect at all above and beyond that shown by the control group.

The findings strongly support a social standard setting analysis of the effects of goal setting. If setting a goal automatically sets up processes of self-evaluation and self-consequation, this should occur in both the private and public groups. Indeed, the private groups should probably be more likely to self-evaluate and self-consequate because they set goals with minimal coercion.

GENERAL DISCUSSION

Implications for Self-Reinforcement

The overall patterns of results support public goal setting as a key element in self-reinforcement procedures. In Experiment 1, self-consequation did not add to the effects of public goal setting alone. In addition, it showed that these goal setting effects were due to social standard setting and not to self-standard setting engaged by the goal. In Experiment 2, we extended the applied implications of these results by comparing public and private goal setting in the long-term treatment of a significant study skills problem, and we found that only pub-

lic goal setting was effective in modifying behavior. Private goal setting had no effects beyond that shown by a control group.

It is difficult to see how these results can easily be explained from a social learning analysis of self-reinforcement and goal setting (e.g., Bandura, 1976, 1978; Bandura & Cervone, 1983; Kanfer, 1970, 1977; Kanfer & Karoly, 1972; Locke, 1980). Social learning theorists maintain that the critical factor causing the effectiveness of such procedures is the internal discrepancy between self-standards and one's self-evaluation that becomes predicated on achievement of these standards (Bandura, 1978; Bandura & Cervone, 1983; Kanfer, 1970). If so, it would have to be explained why private goal setting does not initiate this process.

Our results also suggest that self-consequation does not add to public goal setting alone. With few exceptions (e.g., Bellack, 1976), this corresponds to the great body of self-control literature (Hayes et al., in press; Sohn & Lamal, 1982).

It may seem odd that contingent consequation works when done externally, but not when done as part of a self-reinforcement procedure. In external reinforcement, however, a consequence not earned is a consequence lost. In self-reinforcement, usually at best a consequence not earned is a consequence delayed, because the subject owns the consequence to begin with. For example, in Experiment 1, the students knew they could leave with the leftover food they did not use as a consequence. It is not clear that even external consequation would be effective under similar circumstances. For example, would a person work a certain number of hours for a weekly salary if any hourly salary not earned would automatically be received later (say, at the end of the month) anyway? Probably not. Yet this is precisely the common condition experienced in experimental studies on self-reinforcement where the consequence is owned by the subject.

Our results do not suggest, however, that self-consequation cannot add to goal setting under certain conditions. Indeed, they imply what those conditions are. One condition would occur if a contingency and consequence is self-selected and is known to others, a past history of social consequences and the current social situation is such that this public availability ensures consistent use of the stated consequences, one of the following conditions exists: (a) delay in access to the reinforcer produced by a failure to meet the contingency is highly aversive, or (b) the contingency arranges for permanent loss of a reinforcer if the behavioral goal is missed, and the reinforcing effects produced by the stated contingency are significantly above the effects produced by the social contingencies engaged by public goal setting alone.

That true self-reinforcement effects have rarely been found even when the procedure is public (Sohn & Lamal, 1982), suggests that these conditions are uncommon or may even be nonexistent. One problem is that a history of consistent, social consequation sufficient to produce consistency with the self-imposed contingency probably also is associated with strong discriminative effects for public goal setting alone. Thus, if you need more than public goal setting you are probably likely to cheat on the contingency anyway. A second problem is that the strong contingencies mentioned earlier are probably difficult to arrange in self-control procedures, precisely because they are strong.

There is another way self-consequation could conceivably add to goal setting, according to a socially based analysis. If the consequence selected itself sets an even higher social standard (for example, it is clear that people now "believe you really mean it" because of the reinforcer selected), then adding a consequence could be impactful due to the social contingencies it engages. Apparently, however, that is rare, based on the rarity of properly controlled studies that have found an additive effect for self-consequation over goal setting alone (Sohn & Lamal, 1982).

The present results suport the view of some (e.g., Catania, 1975; Gewirtz, 1971; Goldiamond, 1976a; Nelson et al., 1983) that self-reinforcement is a misnomer. Instead, it seems more parsimonious to view self-reinforcement as a special arrangement of external reinforcement. The results also provide one more bit of evidence that

interpretations of therapeutic techniques that appeal to the "self" as a causal agent may not be productive in the long run. Rather than attempt to explain complex human behavior by referring to other similarly complex behaviors within the same individual (e.g., self-efficacy, self-reinforcement), it seems more worthwhile to identify the actual physical conditions that give rise to both.

Social Standard Setting As A Mechanism

A number of closely related accounts could conceivably explain these results. Our interpretation in this and other studies (Hayes & Wolf, 1984; Rosenfarb & Hayes, 1983; Zettle & Hayes, 1983) is that therapeutic change is often due in part to social standard setting. This interpretation states that one strives to perform consistently with socially established criteria based on a past history of socially based reinforcement for doing so. Social reinforcement implies not only the presence of social consequences but also their contingent use. Social standards essentially establish the nature of the contingency. In the past, when lenient standards were set, mediocre performance lead to social reinforcement. When stricter standards were set, higher performance was required. Naturally, there are other contingencies (also socially based) that can influence this simple relationship. If a standard is set coercively, or in ways that seem (to the verbal community) to be unfair, the person may not work to meet the standard (Brehm, 1966; Tedeschi, Schlenker, & Bonoma, 1971; Zettle & Hayes, 1982) because this is also socially sanctioned.

Rachlin (1974) has proposed another environmentally based account for the effects of self-reinforcement procedures, namely, that self-control behaviors cue the long-term consequences of behavior that have been experienced in the past. Although there is evidence to support this view (Castro et al., 1983; Castro & Rachlin, 1980; Nelson et al., 1983), it does not specify what environmental consequences are actually cued, nor is it clear that self-control behaviors themselves are required for cuing to take place (Hayes & Nelson, 1983; Nelson & Hayes, 1981). The research reported here can easily be integrated with a cuing analysis if it is recognized that the "long-term consequences" engaged are primarily the social consequences established in the procedure itself. If other consequences were cued, it is difficult to see why the private groups should not have improved.

There has been some diversity in the meaning of the terms "public" and "private" in the literature. In previous research on self-reinforcement or goal setting procedures, private procedures have often been used in the sense that an audience was not immediately present during task performance (e.g., Bandura & Perloff, 1967), but our use of "privacy" involves more than the lack of an audience. Indeed, the "public" groups in experiment 1 had no audience immediately present; "privacy" involves the apparent inability of others to compare performance to an established criterion due to the privacy of the criterion. Note that all students knew that their performance could itself be checked. Similarly, Lyman (1984) recently showed that "private goal setting" was ineffective with emotionally disturbed children in a classroom setting. The goals in that study, however, were shared with the teacher, while efforts were made to conceal the fact that performance was being monitored. It seems that researchers should be more careful to specify what is and is not private in a given study. For example, "private goal setting" should be reserved for situations in which goals truly are private in the sense that apparently no one can know them. Clearly, relative degrees of publicity can also influence the effects of public conditions (e.g., Lyman, 1984; Van Houton, Hill, & Parsons, 1975), but the present conceptual point requires that truly private conditions be compared to more public conditions.

Both the importance of social context and the difficulty in developing truly private treatment controls have been well documented in the social psychology literature. For example, although it is generally conceded that private commitments have relatively little effects on behavior (Kretch et al., 1962), it is also known that subjects are extremely sensitive to the potential public nature of their commitments. In one study, statements written on a sheet of paper and then thrown in the trash were seen as "public," and only when the statements were written on a "Magic Pad" and then erased

did subjects act as though the statements were truly private (Deutsch & Gerard, 1955). Thus, even if an apparently private condition works, the effects could still be due to hidden social factors. Only if an intervention does *not* work when private, can purely self-based effects be completely ruled out.

Social factors have long been thought to have some influence on treatment outcomes. Our series of studies suggest, however, that such factors may be essential to the effectiveness of many psychotherapeutic procedures.

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